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Sanitary Achievements in the Philippine Islands, 1898-1915

Smallpox and Vaccination in the Philippine Islands, 1898-1914

Leprosy in the Philippine Islands

Written December, 1914, for the Panama-Pacific International
Exposition, San Francisco, California, February 20, 1915—
December 4, 1915

BY

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JUNE, 1915

Sanitary Achievements in the Philippine Islands, 1898-1915

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By

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The United States of America may well be proud of the results attained along the lines of sanitation and hygiene by her sanitarians in the Philippines during the past sixteen years, especially when it is known that these have been achieved with the expenditure of about 10 cents per capita per annum.

There is no doubt but that, from a sanitary standpoint, the Philippines today are far in advance of most other Oriental countries and in fact of many states in the home country.

It is impossible in a publication of this size to do more than touch upon a few of the more important lines of work and the results obtained.

ORGANIZATION.

When, on August 13, 1898, the United States assumed control of the Philippine Islands, the former city authorities were asked to turn over the sanitary service and records of vital statistics, but it was found that beyond an appropriation of $4,800.00 for municipal physicians and medicines for the poor and $2,000.00 for a municipal laboratory in Manila, no such service existed, nor had any compilation of vital statistics been made. It became necessary, therefore, to establish a health organization that would meet the needs of the situation.

To this end Brigadier-General Hughes, U. S. A., on September 29, 1898, issued an order which created a Board of Health for the City of Manila under the provisions of which the city was divided into ten sanitary districts and a native physician placed in charge of each, whose duties included the medical care of indigents, the reporting of insanitary conditions and dangerous communicable diseases, the investigation of causes of deaths, and the furnishing of certificates of death in all cases where death occurred without medical attention.

In addition to the ordinary functions of a Board of Health, the Board exercised general supervision over charitable institutions, prisons, and a hospital for venereal diseases, and directly supervised the vaccine plant, municipal laboratories (which the Board organized), free dispensary, and hospitals for leprosy, smallpox and plague.

Eight municipal midwives were employed, but it was a difficult matter to induce the people to avail themselves of their services. A plan is now under way to operate a Training School for Midwives in connection with the Nurses' Training School at the Philippine General Hospital. By this means it is hoped to supply the Islands with about 200 trained women per year.

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*A portion of the data and certain statements were taken from the annual reports of the Bureau of Health for the Philippine Islands.

Previous to this time the registration of vital statistics was in charge of the parochial priests. The Board at once undertook the work of securing and compiling vital statistics, and required the registration of physicians, pharmacists and dentists. Comprehensive laws have since been passed which created examining boards for the professions named, and registration is granted after passing examinations that compare favorably with those held in the United States.

The more prevalent diseases encountered at this time were smallpox, leprosy, malaria, dysentery and diarrhoeas.

LEPROSY.

Leprosy was found to be widely distributed, the Franciscan priests estimating the total number of lepers in the Islands at 30,000. This estimate was entirely too high, as it is probable that less than 10,000 cases existed in 1898.

The necessity for the segregation of lepers was recognized and efforts made to inaugurate and carry the plan to a successful issue, but many obstacles were encountered, and beyond the isolation of a limited number of cases at San Lazaro Hospital in Manila and two similar institutions in the provinces, nothing definite was accomplished until May 1906, when the present colony at Culion was opened. To date more than 8,000 lepers have been segregated at Culion, and the present number of colonists exceeds 3,400, the majority of whom are quite well satisfied with their lot. It is believed that hereafter the number of cases encountered outside the colony will gradually diminish.

MALARIA.

Malaria among the soldiers stationed at several points outside of Manila at once became a troublesome problem, but by forcing them to sleep under mosquito nets, and by the liberal use of quinine the disease became less and less prevalent. Gratifying results have since been obtained by the filling of stagnant pools or, if this could not be accomplished, by the use of crude oil and other sanitary measures. Within the past year quinine has been placed on sale with the municipal treasurers of the provincial towns, and this very useful drug may now be secured at a nominal rate. Formerly as high as 10 cents per 5 grain tablet has been charged in some of the more remote towns.

BUBONIC PLAGUE.

Bubonic plague appeared in Manila on December 29, 1899, and was almost continuously present to some extent until April 1906, after which no further cases occurred until June 19, 1912, when a fatal case occurred. During the remainder of the year 49 cases were reported, the year 1913 produced a total of 20 cases, and during the first nine months of 1914 there were 26 cases, at the end of which time it was believed to be eradicated. The city of Manila has passed an ordinance prohibiting the erection of buildings with hollow walls or ceilings, and this will do much toward the elimination of the rat and consequently of the plague carrying flea.

BERIBERI.

Beriberi formerly caused hundreds of deaths annually in Government institutions. After extended research it was found that the use of polished rice as the main article of diet bore a direct relationship to the incidence of the disease. The Governor-General on May 4, 1910, issued an executive order prohibiting the use of polished rice in Government institutions, and the effect of the substitution of unpolished for polished rice was very soon apparent.

During the year 1908 a total of 244 deaths from beriberi were registered at the Culion Leper Colony. For the two years ended June 30, 1914, during which time unpolished rice was furnished, a total of 3 deaths from this disease occurred. At Bilibid Prison similar results were obtained. It is probable that the few deaths registered were in the advanced stage of the disease at the time of admission to these institutions.

ASIATIC CHOLERA.

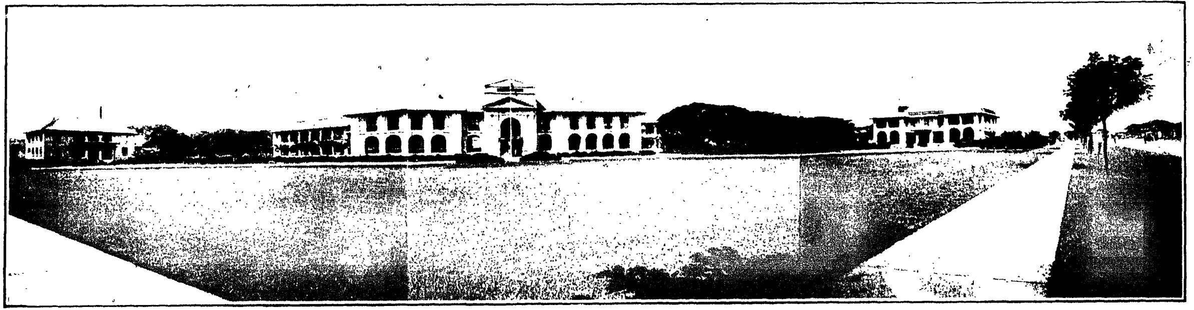
Cholera has caused as many as 100,000 deaths in one year in the Philippines. The prompt and efficient isolation of cases and carriers, and thorough disinfection of all fomites and of the house and the adjoining ground where infected material was thrown and the proper disposal of faeces and vomited matter have made it possible to hold the disease in check with a reasonable degree of certainty. Hundreds now die of the disease where formerly thousands died.

HOSPITALS.

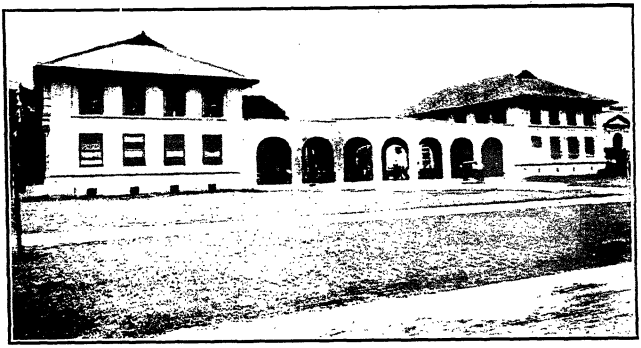
Outside of Manila a few hospitals were found, the majority of which were constructed of bamboo and nipa palm leaves and were entirely devoid of sanitary accommodations.

At the present time there are three modern Government hospitals in the provinces, the materials and equipment for one of which had to be transported by hand to an elevation of about 3,000 feet over narrow mountain trails. Four smaller and less modernly equipped hospitals are also maintained by the Government in provincial towns, while others are under consideration. A number of mission and private hospitals are to be found in the provinces.

In Manila the hospital facilities were found to be extremely inadequate. During March, 1901, a "Women's Hospital" was opened, and on August 6, 1901, the Philippine Commission passed a law making it incumbent upon the Government to render medical assistance to its employees. To meet this requirement the Civil Hospital was opened during October of the same year. This institution, in connection with the San Lazaro Hospital for the care of dangerous communicable diseases, met the needs of the Government for a time, but it soon became apparent that additional hospital facilities were a necessity. Finally, on September 1, 1910, after a period of



THE PHILIPPINE GENERAL HOSPITAL, MANILA, P. I.
The most modern hospital in the Orient.



THE NEW DISPENSARY AT THE PHILIPPINE GENERAL HOSPITAL, MANILA.

More than 60,000 persons are treated here annually.

nearly ten years of effort and planning, the Philippine General Hospital opened its doors to the public. This institution has a capacity of about 375 beds and is so planned that it may, by the pavilion system, be increased to a 1500 bed hospital. It is believed to be the best and most modern hospital in the Orient.

San Lazaro Hospital, already referred to, is utilized for the care of all classes of dangerous communicable diseases and the insane. Plans are now under way to build a modern insane asylum just outside of Manila.

In addition to the Government institutions, there are five other fair-sized and several smaller hospitals in Manila, some of which the Government assists in maintaining.

WATER AND SEWER SYSTEMS.

Water and sewer systems were practically unknown and no attempt was made properly to dispose of human or other wastes. A large part of such wastes, even in Manila, were thrown into the streets and hogs and chickens acted as scavengers.

At the time of American occupation of the Islands, Manila derived its water supply from the Mariquina River, the Pasig River, and from wells and cisterns. The main supply came from the first-named river, which has its source in the mountains some ten or twelve miles from Manila. After flowing through three towns, which used the river as a common dumping ground and for bathing and washing purposes, the water was pumped into two subterranean reservoirs, hewn out of a soft white rock, which were ventilated by means of numerous cupolas. One reservoir had a capacity of 6,300,000 gallons, and the other 8,200,000 gallons. The city was supplied by gravity but, on account of the low elevation and small mains used, in some sections the pressure was practically nil.

Examination of the water showed it to be at all times dangerous for domestic use, and at one time it showed as many as 613,703 bacteria per cubic centimeter.

AN OLD INSANITARY SURFACE WELL AT PASIG, RIZAL.
A dangerous water to drink.

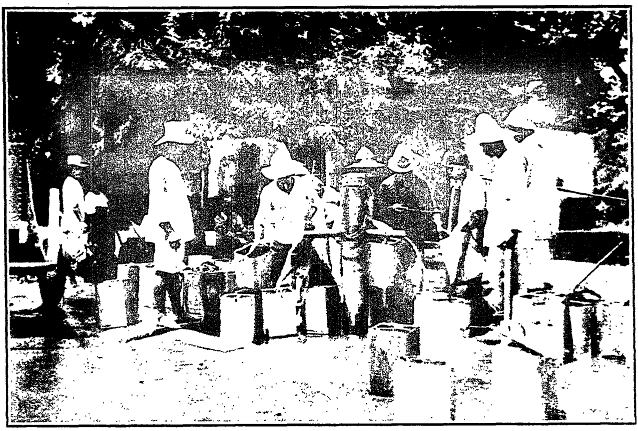
The total connections to the system on August 31, 1902, numbered 3,329, of which only 1,825 were private connections. The population of the city at this time was about 220,000, hence a very small percentage of the people were availing themselves of the doubtful benefits of the system.

In view of the fact that the capacity of the *deposito* amounted to only a two days' supply of water for the city and of the vitally important fact that the water was a constant menace to the public health, it was realized that a purer and more adequate supply was an imperative necessity.

This was finally secured on November 12, 1908, when the present supply was made available. The watershed of the Mariquina River was cleared of its 10,000 inhabitants and a dam constructed across a gorge at the outlet, thus providing a natural reservoir with a capacity of 50,000,000 gallons. The pipe line to the city is capable of supplying 22,500,000 gallons daily, and in an emergency the old reservoirs can be utilized to supply an additional 15,000,000 gallons. A total of 7,227 private connections have been made and 258 street hydrants are available for those who cannot afford to pay for the necessary connection.

The pressure of the new system is 40 to 55 pounds to the square inch, the reservoir being 140 feet above the datum level of the city. The pipe line is 42 inches in diameter and 10½ miles long. The total cost was about $2,000,000.00.

In the provinces the water supply was secured largely from rivers and shallow surface wells, oftentimes without walls and the opening flush with the ground level. It is not surprising, therefore, that the death rate was often as high as 50 per thousand per annum. Efforts were made, with more or less success, to improve the water supply by encouraging the people to use only the better class of wells and to discontinue



ARTESIAN WELL, CALOOCAN, RIZAL.
A safe water for domestic use.

the use of river water. No satisfactory results were obtained, however, until the drilling of artesian wells was begun in 1905. Rapid strides have been made along this line, and at the present time more than 1000 of these wells are in operation. Their use has resulted in a marked diminution in the number of cases of intestinal parasites and other intestinal disorders.

The average death rate for the provinces during the year 1913 was 21.53 per 1000 inhabitants, and the artesian wells may safely be accredited with a fair percentage of this highly gratifying reduction in the provincial mortality rate.

Fairly satisfactory results have been obtained by the treatment of waters containing amoebae with calcium hypochlorite.

SEWER SYSTEMS.

Measures were at once adopted to minimize the dangers arising from the lack of sewer facilities, and on August 22, 1901, the Board of Health passed a resolution which provided for the establishment of a sanitary pail conservancy system for night soil. This system, together with the old insanitary septic vaults, was used until the completion of the present sanitary sewer system in Manila, which was begun during the fiscal year 1907 and completed May 25, 1909, at a cost to the Government of about $1,650,000. Fifty-two miles of sewer pipes were laid in order to give a satisfactory system to the city as a whole. This installation easily ranks with the best to be found in the Orient. The maintenance cost amounts to about $75,000 per annum.

The sewers range in diameter from 7.874 inches to 5 feet 8.9 inches, and the slopes are sufficient to warrant a velocity of not less than 25.59 inches per second when flowing one-half full. The minimum depth is 4 feet 11 inches, and the maximum depth is 17 feet 8.6 inches.

Five substations are required to give the system the flow mentioned above, and are located as follows:

	Gallons per 24 hours.
Ermita, with a capacity of	5,000,000
Santa Cruz, with a capacity of	12,000,000
Quiapo, with a capacity of	5,000,000
Malate, with a capacity of	2,000,000
Paco, with a capacity of	800,000

These pump the sewage to the main pumping station, which is located on the beach in the lower part of Tondo and has a capacity of 25,000,000 gallons for twenty-four hours. The main station has a lift of approximately 28 feet 10.45 inches, and discharges into the bay, through a 3 foot 5.34 inch cast-iron force main laid 10 feet below the bed of the bay, at a point approximately 1 mile from the shore. This pipe terminates in a vertical position, which was done for the purpose of making the discharge take place above the bottom of the bay. The outlet end is encased in a huge block of cement masonry which rests upon a timber platform supported by a group of piles.

Branches or outlet pipes have been provided at intervals of 39.37 feet throughout practically the entire sewer system. The system is ventilated by omitting the vent pipe and continuing the soil pipe and vent pipe of each house connection through and above the roof. Flush tanks with suitable connections to the water system supply have been constructed at the ends of the primary lateral sewers for the purpose of keeping them clean and in a satisfactory condition. These tanks have been built to hold about 349 gallons of water each, and are provided with gates and handles for operation by hand. This feature is unique and has been introduced for the first time in Manila.

The pumping plant consists of centrifugal pumps driven by electric motors, and are supposed to be automatic, the rise and fall of the sewage in the sewer starting or stopping the pumps as occasion may require.

MOATS.

A massive stone wall as a protective measure was begun around old Manila in 1571 and completed during the eighteenth century. On the outside of and surrounding this wall was a moat which had degenerated into a swamp or morass covering 25 acres of ground. A number of private house drains emptied into it and carabao wallowed in its mud and slime. Inasmuch as there was only a slight circulation of water, it was in a very filthy condition and afforded an ideal breeding place for myriads of mosquitoes.

This whole area has now been reclaimed by filling in and at present is covered with a well kept lawn and affords ideal grounds for athletic sports.

MARITIME QUARANTINE.

Sixteen years ago maritime quarantine as enforced in the Islands was ineffective. Dangerous communicable diseases were frequently introduced without concerted efforts being made to prevent their importation.

A very efficient service was established and is maintained by the United States Public Health Service.

One of the most modern quarantine stations in the world has been constructed at Mariveles, Bataan Province, which is situated at the entrance to Manila Bay, about 30 miles from Manila.

A similar but smaller station is located at Cebu for the convenience of vessels which desire to enter one of the southern ports.

These stations have on numerous occasions prevented the introduction of dangerous communicable diseases into the Philippines.

DEATH RATE IN MANILA.

The death rate in Manila among the 4,412 Americans for the fiscal year 1913 was 8.42 per 1,000 and for Americans in the Government service it was 2.47 per 1,000. These figures show that even after making due allowance for the fact that the Government employees were selected only after a satisfactory physical examination, the expectancy of life for Americans is quite as good in Manila as in the United States.

GENERAL CONDITIONS.

Fifteen years ago the Philippine Islands were unenviably known from a sanitary standpoint. Today they are setting the pace along many lines for the countries most advanced in the science of sanitation.

The temperature in the lowlands ranges from about 65 to 98 degrees Fahrenheit, while in the mountains the extremes are about 35 and 80 degrees Fahrenheit.

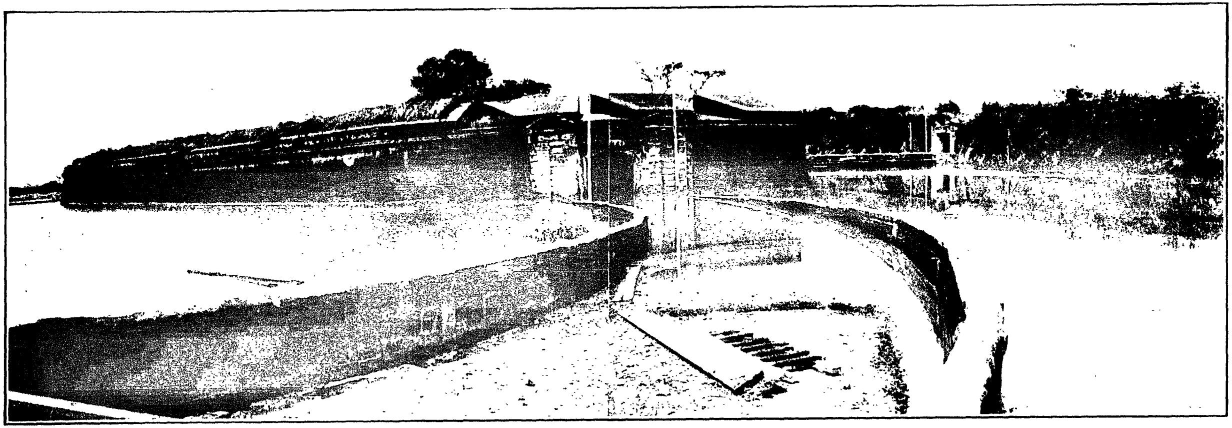
The average Manila rainfall during the so-called dry season amounts to about 14.7 inches and during the wet season to about 44.8 inches.

It will be seen, therefore, that a low temperature, which is of great aid to the sanitarian in temperate zones, does not exist in the Philippines. Insects thrive at all seasons of the year.

Fifteen years ago there were in Manila about 31 miles of esteros, or canals, which were in many instances extremely filthy. They have been in part filled up, and the remaining ones have been dredged out so that the water flows in and out with the tide; in some instances they have been walled up, so that instead of constituting a nuisance they now serve as useful arteries of commerce.

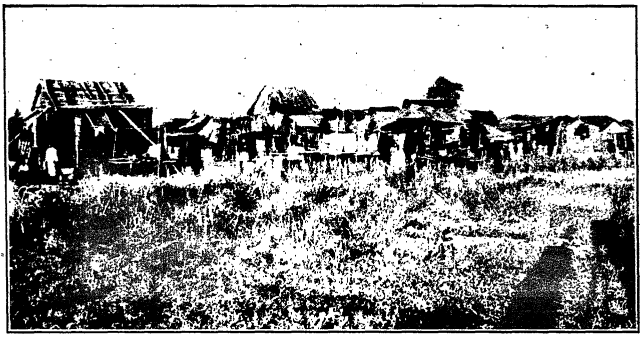
Formerly no provision was made for the care of the insane; they were of necessity often tied up when intractable. At present two institutions in Manila are open to this class of patients, and a project is under way to build a modern asylum just outside of Manila.

The Government operates a plant in Manila that is capable of producing 100,000 pounds of ice and 5,000 gallons of distilled water daily. These products are sold to the public at the nominal rates of 4/11 of 1 cent per pound for ice, and about 1 cent per quart for water delivered. The plant also provides extensive cold storage facilities.



SECTION OF THE OLD INSANITARY MOAT AROUND THE WALLED CITY OF MANILA.
Now beautiful sunken gardens.

SUNKEN GARDENS, MANILA.
Formerly an extremely insanitary moat. Now used for athletics.
Manila Hotel in background.
Shows Gral Luna entrance to the Walled City and Aquarium.



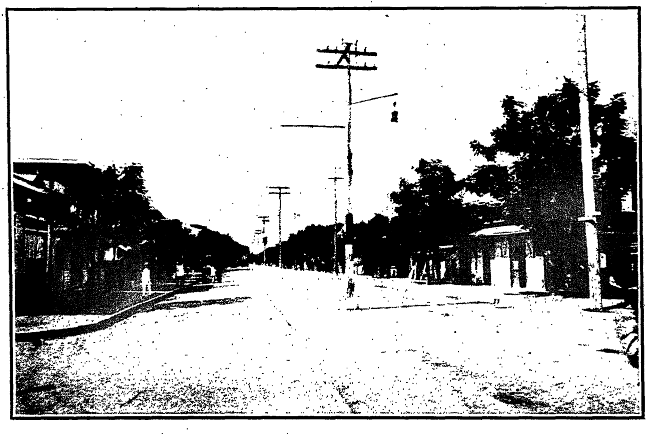
INSANITARY SECTION OF MANILA IN 1908.
Many blocks of this type of houses have been removed.

Several other ice plants are in operation in Manila and a number of the larger provincial towns are provided with plants. Ice is also shipped by rail from Manila to many of the towns reached by the railroad lines.

Bulletins on the subject of sanitation and hygiene are issued by the Bureau of Health from time to time. Some of these are taught in the 3,500 or more public schools as well as by members of the sanitary organization throughout the Islands.

More than 300 provincial boards of health have been organized and are doing missionary work along sanitary lines.

The functions of the Bureau of Health are much more comprehensive than is implied by the title, since its duties include



RIZAL AVENUE, MANILA.
This street was formerly one of the most insanitary in the city.

not only the compilation of vital statistics and the safeguarding of the public from dangerous communicable diseases, but embrace the administration of public charities, the care of the insane, orphans and the infirm, the administration of general and special hospitals, the hygienic and medical care of all Government employees, the sanitary control of cigar and cigarette factories; it acts in a semi-missionary capacity in connection with the organization of Government units among the wild tribes, and in short comes in contact with the majority of the activities of the Archipelago.

Modern antituberculosis measures have been adopted and hospitals for the care of this disease opened. At Baguio, which has an elevation of nearly 5,000 feet, uniformly good results have been obtained in the fresh air treatment of the disease.

Smallpox and Vaccination in the Philippine Islands, 1898-1914

By

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It is probable that in no other way have the results obtained by sanitarians in the Philippine Islands since American occupation been more satisfactorily or conclusively demonstrated than by vaccination for the prevention of smallpox.

Sixteen years ago the annual deaths from smallpox in the Islands were very conservatively estimated at 40,000. During the year 1913 a total of 823 deaths were reported, none of which occurred in Manila.

What is responsible for this almost unbelievable reduction in the death rate from this dread disease? The answer is that about 18,000,000 vaccinations have been performed in the Philippines during this length of time.

The military authorities began the work of vaccinating throughout the country as fast as it became opened up. The reports of the chief vaccinator under the Spanish regime show that from November 3, 1894, to October 25, 1898, when the municipality of Manila was transferred to the administration of the United States, a total of 9,136 vaccinations were performed. During the year 1899 a total of 103,931 vaccinations were performed in Manila alone, notwithstanding the fact that the authorities deemed it inadvisable to permit forcible vaccinations on account of the probability of creating a lasting prejudice against this very necessary measure.

The necessity for systematically vaccinating the population of the entire archipelago soon became apparent. This was made possible by Act. No. 309 of the Philippine Legislature, which was passed on December 2, 1901, and made vaccination compulsory. The work was begun in 1903, and the following table shows the progress of the campaign:

Province.	Date of Beginning.	Date of Completion.	Total Vaccinations.
City of Manila	Jan. 1903	Dec. 1904	306,169
Cagayan	July 1904	July 1905	121,155
Cebu	July 1904	Nov. 1906	563,599
Isabela	Dec. 1904	Mar. 1905	67,488
Rizal	Jan. 1905	Sep. 1905	97,808
Romblon	Apr. 1905	Apr. 1905	21,343
Cavite	Apr. 1905	Apr. 1906	97,528
Union	Apr. 1905	Nov. 1906	128,256
Ilocos Norte	May 1905	Sep. 1906	164,136
Bataan	Sep. 1905	Dec. 1905	34,834
Ilocos Sur and Abra	Sep. 1905	Apr. 1906	212,195
La Laguna	Oct. 1905	June 1906	126,062
Batangas	Dec. 1905	Dec. 1906	257,502
Pampanga	Jan. 1906	June 1907	165,669
Oriental Negros	Mar. 1906	Mar. 1907	132,790
Ambos Camarines	Sep. 1906	Apr. 1908	260,481
Bohol	Oct. 1906	Jan. 1908	264,002
Occidental Negros	Oct. 1906	May 1909	90,926
Bulacan	Nov. 1906	May 1908	221,119
Capiz	Nov. 1906	May 1909	370,505
Zambales	Dec. 1906	Feb. 1907	55,730
Sorsogon	Jan. 1907	Jan. 1908	128,366
Tayabas	Jan. 1907	Oct. 1907	195,132
Lepanto-Bontoc	Jan. 1907	May 1908	39,901
Iloilo	Jan. 1907	June 1909	819,286
Pangasinan	Mar. 1907	Oct. 1907	435,638
Nueva Ecija	Apr. 1907	June 1908	136,734
Tarlac	May 1907	Jan. 1908	155,679
Albay	July 1907	May 1908	254,948
Surigao	Jan. 1908	Dec. 1908	96,452
Misamis	Jan. 1909	Mar. 1910	130,900
Mountain	Feb. 1909	May 1909	23,190
Antique	June 1909	Mar. 1910	96,341
Mindoro	Jan. 1910	Apr. 1910	35,525
Leyte	May 1910	Apr. 1914	584,969
Agusan	June 1910	Feb. 1911	35,259
Samar	Oct. 1913	June 1914	*104,997
Moro (not yet systematically vaccinated).			
Total systematic vaccinations			7,032,614

In addition, non systematic vaccinations to the number of about 11,000,000 have been made which bring the grand total up to, in round numbers, about 18,000,000.

In carrying on the work of systematic vaccination it has been customary to employ groups of 20 to 50 native assistant sanitary inspectors, each of which was placed under the supervision of a physician or an American sanitary inspector. The towns of a province were vaccinated in geographical order, and the itinerary so arranged that a number of the vaccinators would return to a vaccinated town a week or ten days subsequently and inspect the vaccinations. Certificates were given to persons obtaining a positive result, while those showing no result were revaccinated.

*Vaccinations still continue.

The same procedure has, in part, been followed in making the non systematic vaccinations, the exception being that towns in which an outbreak of smallpox was reported were first visited.

The law provides that all district health officers shall semi-annually cause to be vaccinated all unvaccinated persons or those not recently vaccinated, in their respective districts.

Opposition to vaccination among the natives and even among a certain percentage of Americans was at first very marked, especially in the remote provincial towns. This antipathy has been largely overcome and the semi-annual vaccinations are taken as a matter of course.

It has so happened that now and then one of the misguided, American anti-vaccinationists has managed to evade vaccination and has paid dearly for his folly.

The deaths reported throughout the Islands from smallpox during the past 5 years are as follows:

During the year 1909	6,212 deaths.
During the year 1910	3,044 deaths.
During the year 1911	1,192 deaths.
During the year 1912	567 deaths.
During the year 1913	823 deaths.

During this period no deaths from the disease have been reported in Manila.

Were it possible to carry out the provisions of the compulsory vaccination law, it is absolutely certain that the disease would disappear from the Philippine Islands.

The virus used is all manufactured by the Government laboratories in Manila and is put up in the moist form in 100 unit tubes, which amount, if properly conserved, is sufficient for 100 vaccinations.

The method commonly employed in performing a vaccination is as follows:

(1) Cleanse the site with a pledget of cotton saturated with alcohol and allow to dry.

(2) Place a small amount of virus on the spot to be scarified, using the lancet end of the vaccinating instrument after sterilization to convey the virus from the tube to the arm.

(3) A five point scarifier is ordinarily used to introduce the virus. Care is used not to draw blood. The instrument is sterilized by passing it through a flame.

(4) Allow the virus to dry.

(5) No dressing is applied.

Despite the efforts that are often made to wash off the virus or to render it inert by the application of washes, herbs, etc., almost no ill effects are noted, which indicates that the virus furnished is of excellent quality.

The following experience of the writer will illustrate how trivial a matter will sometimes interfere with the success of such a campaign.

While vaccinating the province of Cebu, during which campaign over 200,000 persons were vaccinated, it was noted that many people were hiding and that considerable difficulty was experienced in persuading others to submit to vaccination. This experience was repeated in two or three towns. Finally the municipal president of one of the towns explained the cause of the difficulty. The virus used at this time was put up in amber colored glass tubes, while that previously used had been supplied in clear tubes. It appeared that a man in one of the towns had made the statement that the new virus was poison as it was not the same color as the old. The story quickly spread from town to town, and the result was that many people hid in the woods and in many instances children and babies were found in boxes, cupboards and similar hiding places.

One of the greatest difficulties encountered in carrying on the work in provincial towns is that the glycerinized virus will not retain its potency for more than a week or ten days if not kept on ice. In many remote municipalities more than a week is required to transport it to these towns, and as it is often carried by foot messengers, over rough mountain trails, it is impossible to transport heavy ice chests.

Persistent effort has been made to secure an efficient dry virus but without any encouraging degree of success to date. Several lots of such a virus have been made at the Government laboratories, and while one lot or one tube would be satisfactory, the results obtained from the next would be negative.

The percentage of successful vaccinations with the Government virus in previously unvaccinated persons varies, but will average from 60 to 70 per cent.

The only argument necessary to explode the theories of the anti-vaccinationists is to compare the visages of the children of today with those of their parents. Very few of the former are disfigured from smallpox, while a comparatively large percentage of the latter bear the scarred faces, and only too often the loss of sight or other disfigurements, which formerly were so common as a sequel to smallpox in the Islands.

It will be a difficult matter to convince an unbiased judge that a measure that has reduced the number of deaths from smallpox in the Philippine Islands from over 40,000 to a few hundred per annum in the space of 16 years is not a meritorious one.

Leprosy in the Philippine Islands

By

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It is stated on reliable authority that leprosy was introduced into the Philippine Islands in 1633. It appears that the Emperor of Japan sent a ship with 150 lepers on board, as a present, to be cared for by the Catholic priests. They were allowed to land and as no practical measures were taken to prevent the spread of the disease, it steadily increased until 1906 when the Culion Leper Colony was opened.

During the Spanish regime there was a division of authority between the Church and the State, and in the matter of health measures and vital statistics it appears that the Church assumed the major part of the responsibility.

Leper institutions were conducted by the Church along charitable lines, more for the purpose of aiding individual sufferers than with the view of preventing the spread of the disease.

The first leper hospital was established in Manila in 1633, on what is now Calle Concepcion, by the Franciscan order as a part of their general hospital which had been in operation since 1603. A comparatively small number of lepers were cared for in this institution until 1784, with the exception of a few years between 1662 and 1681, when they were removed to a safer place because of a threatened invasion by Chinese pirates.

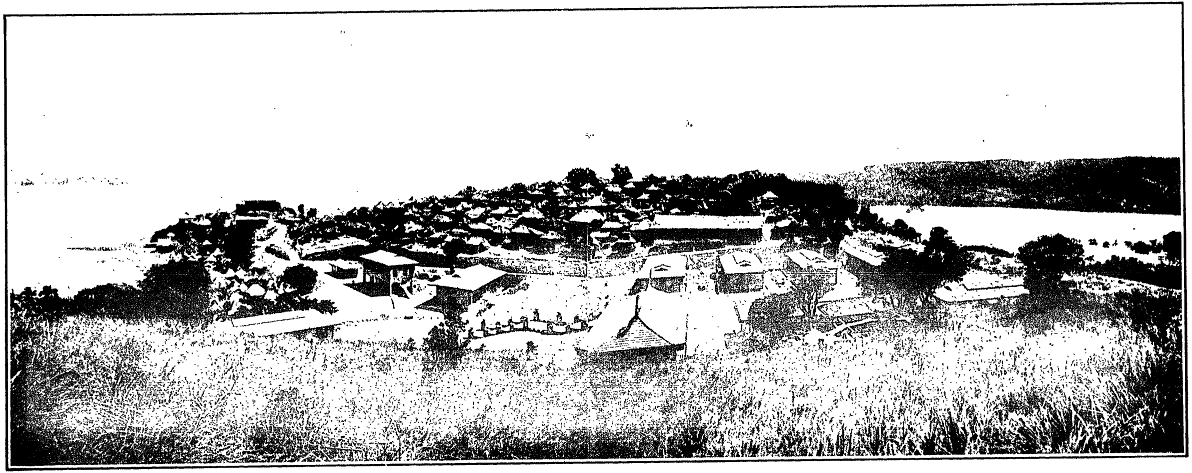
In 1784, upon the expulsion of the Jesuit order from the Islands, the Spanish Government took possession of the present San Lazaro Estate and transferred it to the Franciscans, who built a leper hospital on a portion of the estate at a cost of about $13,770.00. They called the institution San Lazaro Hospital and this building with a number of additions constitutes the present Government institution, designated by the same name, for the care of dangerous communicable diseases in Manila.

The hospital was abandoned on August 12, 1898, the day before the surrender of the city to the American arms, as the priests considered it unsafe to remain outside the Walled City, and the hospital was found practically empty after the occupation took place. The lepers were gradually returned to the institution as they were apprehended.

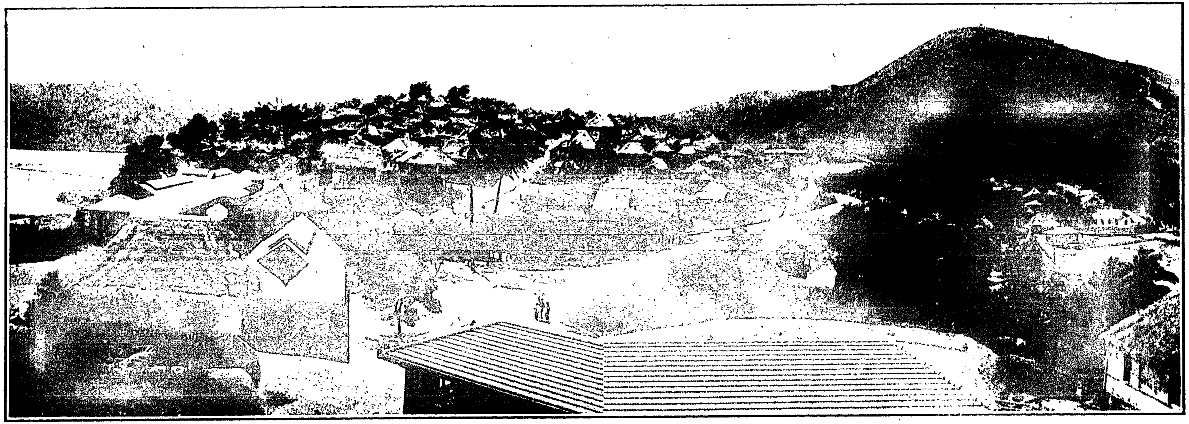
At this time two other leper hospitals existed at Cebu, Cebu, and the Palestina Hospital at Naga (Nueva Caceres), Ambos Camarines, respectively.

The combined capacity of the three institutions was about 500.

It will be seen, therefore, that little or no effort had been made toward the segregation of the leper population.



VIEW OF A SECTION OF CULION LEPER COLONY,
November, 1914.



A SECTION OF CULION LEPER COLONY.
View from the Church, November, 1914.

The Board of Health took up the question of isolating these unfortunates, and considerable time was spent by a committee composed of the Secretary of the Interior, the Commissioner of Public Health and the Sanitary Engineer of the Bureau of Health in examining proposed sites for a leper colony. Finally, on January 1, 1902, Halsey Harbor on the west coast of Culion Island was decided upon as a suitable location and it was the intention to begin the construction of a colony there at once, but an outbreak of bubonic plague in Manila required the presence of the Sanitary Engineer, which necessitated the postponement of building operations until January 1903. A great deal of difficulty was experienced in securing labor and after several months it was decided that the site did not afford a sufficient water supply for a colony of the proportions necessary and it was abandoned during the month of September 1903, in favor of the present location on the northeastern coast of the island, which was formerly the town of Culion.

The property of the inhabitants was purchased by the Government and out of the 67 structures comprising the town those that could be utilized were retained and a sufficient number of others erected from bamboo and nipa to meet the immediate needs of the situation.

On May 28, 1906, lepers from Cebu, Cebu, to the number of 365 were landed at the colony, thus forming the nucleus of Culion Leper Colony, which is now widely known as the largest and one of the best institutions of its kind in the world.

The Chief of the colony had been stationed at the colony for some time prior to the arrival of the first colonists, making arrangements for their coming in order that they might be made comfortable at once. The Chief at first lived across an arm of Culion Bay some two miles distant from the colony proper, but later on moved to the employees' section, about one-eighth mile from the colony.

The colonists are not permitted to pass a specified point which is known as a dividing line between the colonists' and the employees' sections.

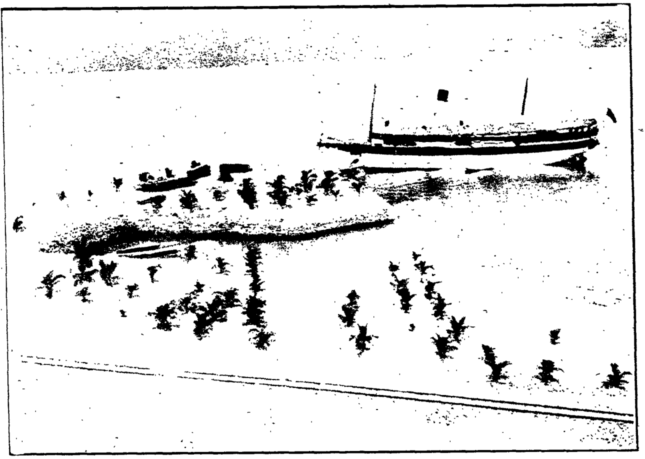
There have been three chiefs of the colony since it was opened. The Chief is the executive officer of the colony, the quarantine officer for Culion, and ex-officio Justice of the Peace. He is not infrequently called upon to act in the latter capacity as at times there have been as many as 500 non-leprous employees upon construction work at the colony and many of them have their families with them, consequently the population of Culion has been as high as 3,600 persons, and disputes occasionally arise.

The Chief, who according to law must be a physician, is assisted by another doctor whose duties consist of the actual medical and surgical care of the lepers.

Four Sisters of Charity of the Order of St. Paul de Chartres and one Jesuit priest were stationed at the colony to assist in caring for the lepers on their arrival. The former have been increased in number to 8, and 2 priests now minister to the spiritual needs of the colonists. The sisters assisted by both male and female leper helpers, selected because of previous experience or adaptability, do all the nursing and surgical dressings for the colony. Frequently there are more than 250 patients in the hospital at one time, and as many as 350 surgical dressings for out-patients are sometimes done during one morning.

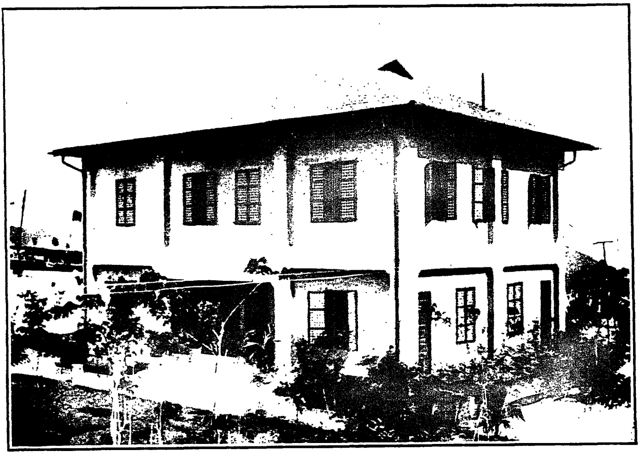
For a number of years the lepers were permitted to elect their own president and councilmen, and ordinances passed by them were submitted to the Chief, who either approved or vetoed the measures as seemed advisable. During 1910 the only American leper at the colony was, by popular vote, elected president. This plan has been discontinued and an advisory council appointed, executive power being vested in the Chief, the Director of Health and the Secretary of the Interior.

For a number of years difficulty was experienced in apprehending lepers, as their friends would secrete them when a collection trip was to be made. Latterly much less opposition has been encountered, and not infrequently persons having friends or relatives at the colony or those having various skin diseases resembling leprosy present themselves and ask to be taken to Culion, the latter class stating that they are outcasts in their home towns. It has been a pleasure to be able to relieve many such cases by treatment and to give them certificates stating that they are not lepers and thus restore them to society.



GOVERNMENT CUTTER, "BASILAN,"
The leper collecting steamer, at the pier, Culion Leper Colony.

Leper collecting trips are made about twice yearly. About three weeks before a trip is to be made the District Health Officers are notified to segregate all the lepers in their districts at a convenient port,—nearly all of the provinces having a seaport. A steamer of about 100 tons capacity is ordinarily



ADMINISTRATION BUILDING, CULION LEPER COLONY.
Located in the employees' section.

used to collect the lepers. A bacteriologist from the Government laboratories accompanies each expedition and examines all suspects. No case is taken unless positive microscopically, with the exception of a few of the clinically positive ones having the anaesthetic form of the disease, it being a difficult matter to demonstrate the bacillus in the purely anaesthetic type without resorting to a nerve section. Cases clinically positive and microscopically negative are examined on the occasion of a subsequent collection and are usually found to be positive.

At the colony a leper police force numbering 15 to 18 is maintained to preserve peace in the colony. They are of great aid to the Chief and render comparatively easy what would otherwise be a difficult situation to meet. When on duty they wear a regulation uniform of khaki, except that on special occasions white is worn. The Government pays them a small salary for their services.

Paid leper sanitary inspectors are of great aid in maintaining the colony in a sanitary condition. A non-leprous native sanitary inspector of the Bureau of Health is in charge of the force under the direction of the Chief of the Colony.

A brass band of about 16 pieces greets newcomers to the colony and gives concerts on special occasions. A string orchestra possessing considerable merit furnishes the necessary music for dances, receptions, etc.

An attractive concrete theatre has been constructed, where the colonists enjoy moving pictures, phonograph concerts, dances and receptions. This building has no walls and is in effect an open air theatre. In case of a driving rain, another nearby hall furnishes a suitable substitute.

Athletic meets are occasionally held and a great deal of interest is manifested in baseball. That they possess the true American baseball spirit was demonstrated at one of the games when both teams attacked the umpire with ball bats.

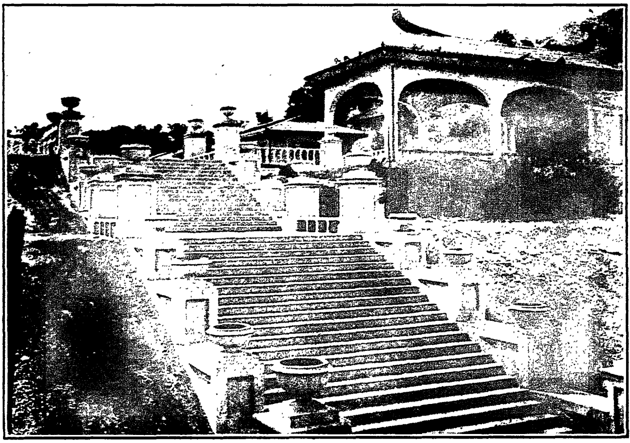
Many of the lepers spend a large part of their time in fishing from rafts made of 6 or 8 pieces of bamboo, 3 or 4 inches in diameter, lashed together. It is not solely a pastime, for the Government pays them at the rate of nearly 4 cents per pound for as many fish as they can catch. A catch of 25 pounds or more in a day for one man is not infrequent.

The Government pays a weekly gratuity of 10 cents to the colonists in addition to providing them with quarters, if they are unable to procure bamboo and nipa to build their own, part of the necessary clothing, and subsistence. The gratuity is paid with a special, aluminum, colony currency which is worth face value in the colony. All money, mail or other effects from the colony are disinfected before leaving Culion.

All leper employees on permanent detail are paid a small monthly salary, and a variety of ways of earning money permits the colonists to accumulate considerable sums.

Since 1906, lepers have been transferred to Culion as follows (readmissions not included):

1906—Second quarter	365
Third quarter	132
Fourth quarter	305
1907—First quarter	1
Second quarter	310
Third quarter	221
Fourth quarter	158
1908—First quarter	1,025
Second quarter	150
Third quarter	257
Fourth quarter	171
1909—First quarter	396
Second quarter	499
Third quarter	198
Fourth quarter	285
1910—First quarter	122
Second quarter	180
Third quarter	229
Fourth quarter	399
1911—First quarter	173
Second quarter	268
Third quarter	0
Fourth quarter	448
1912—First quarter	131
Second quarter	276
Third quarter	261
Fourth quarter	297
1913—First quarter	259
Second quarter	254
Third quarter	204
Fourth quarter	78
1914—First quarter	219
Second quarter	269
Third quarter	140
Total	8,680



THEATRE AND CONCRETE STEPS LEADING TO WORCESTER PLAZA, CULION LEPER COLONY.

On September 30, 1914, a total of 3,464 lepers were segregated at Culion and 125 were detained at San Lazaro Hospital, Manila.

A census of 1,209 of the colonists by ages and sex in 1910 showed the following results:

TABLE OF 1,209 LEPERS IN CULION LEPER COLONY.

Age.	Male.	Female.	Total.
1- 5	2	1	3
6-10	35	16	51
11-15	93	43	136
16-20	150	85	235
21-25	113	82	195
26-30	121	65	186
31-35	66	35	101
36-40	77	26	103
41-45	39	19	58
46-50	30	17	47
51-60	30	18	48
61-70	19	11	30
71-80	6	1	7
81-90	1	1	2
91-	0	0	0
Age or condition not known	2	5	7
Total	784	425	1209

The youngest case was 3 years of age. The number gradually increases up to the age of 17, at which age there were 63; at 18 years the number was almost doubled, being 106;

the largest number occurred at the age of 21, when 139 were registered; at the age of 24 there were 102 cases. From this age the number declines comparatively rapidly.

It will be seen, therefore, that the disease occurs more frequently during early manhood and womanhood.

The proportion of males to females at the colony is usually about 2 to 1.

No definite conclusions have been reached with regard to the method of transmission of the bacillus from one person to another. It would seem, however, that in the absence of an actual wound infection, long continued close association with a case is necessary to induce infection. That the disease is not highly infectious is evidenced by the fact that a large percentage of the population of the Islands have not contracted it when so many widely distributed centres of infection have existed for years.

TREATMENT.

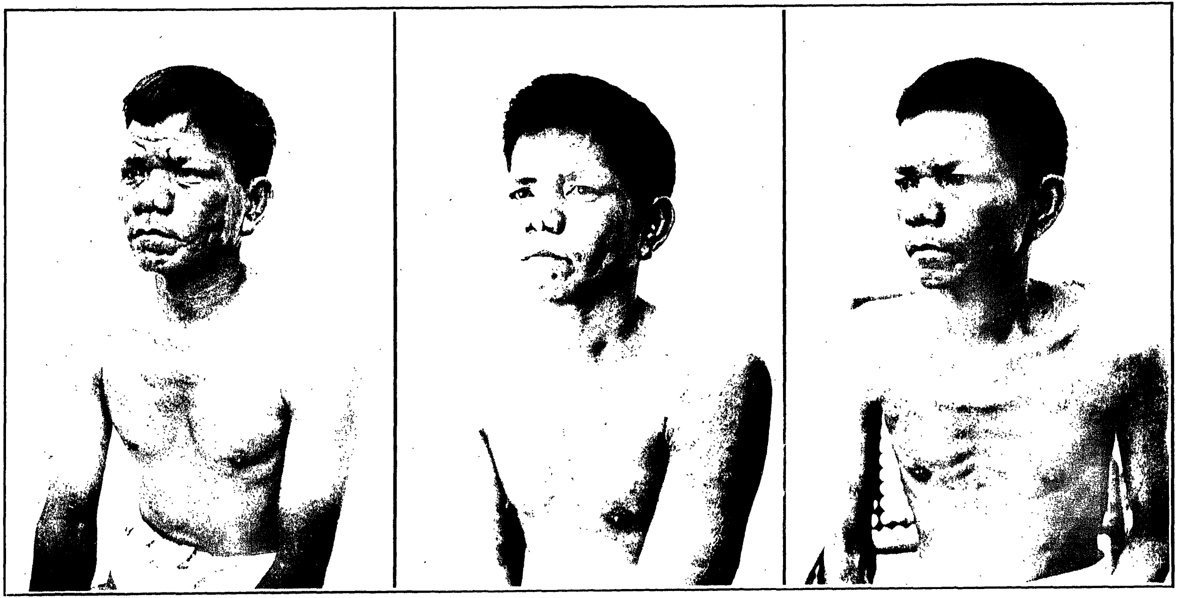
The policy of the Bureau of Health has been to give all bona fide new remedies recommended for the cure of this disease a thorough trial. Very few of them have given encouraging results.

A series of cases for a time appeared to show marked improvement under treatment with the X-Ray, but after the treatment was discontinued they relapsed.

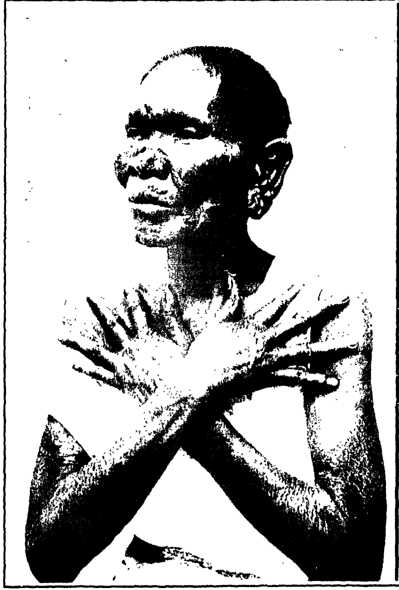
Chaulmoogra oil has given the most promising results. For a time it was exhibited in the form of the crude oil and given by mouth, injection, or inunction, with more or less satisfactory results. During the past few years chaulmoogra oil with camphorated oil and resorcin have given really encouraging results, though these results do not indicate that this combination is in any sense a specific for the treatment of leprosy. The following extract from the annual report of the Bureau of Health for 1913 indicates the method of administering the prescription referred to and the results obtained in two cases:

"On June 11 there were released from San Lazaro Hospital two persons who were formerly afflicted with leprosy and have now been pronounced free from the disease.

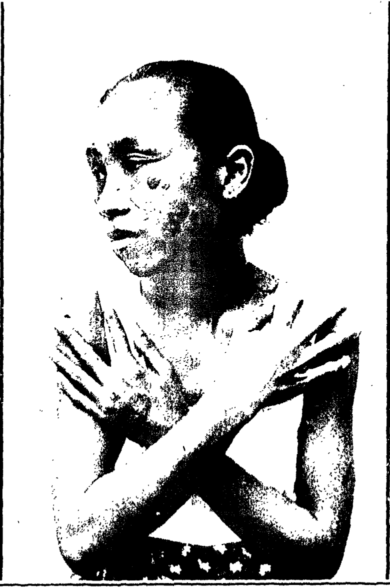
"C. A., male, Filipino, age 27, admitted to the San Lazaro Leper Hospital May 29, 1909. On admission the case presented thickened reddish spots on the nose and thickening and discoloration of the lobe of the right ear. Smears made from the lesions were positive for leprosy bacilli. Beginning August 1909, he received vaccine treatment at intervals for one year, but apparently there was no change in his condition during this period. From September 1910, to November 1910, he took crude chaulmoogra oil by mouth, beginning with daily 15-drop doses and by November reaching 60 drops per day. The oil was given three times daily in divided doses. Beginning in November he received hypodermic injections of the following prescription of Doctor Mercado, house physician at San Lazaro Hospital:



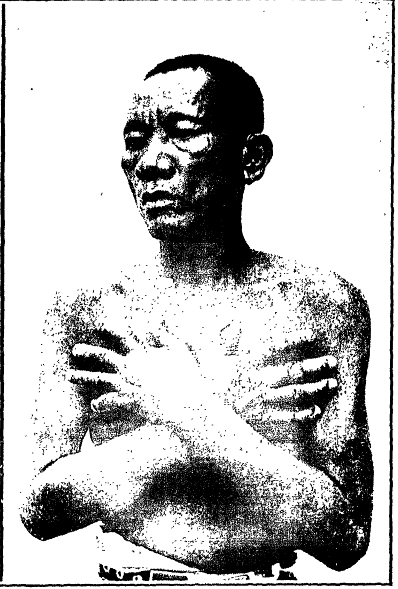
TUBERCULAR LEPROSY.
Showing improvement under treatment with chaulmoogra oil, resorcin, and camphorated oil.
Photographed February 21, 1912, August 19, 1912, and October 28, 1913.



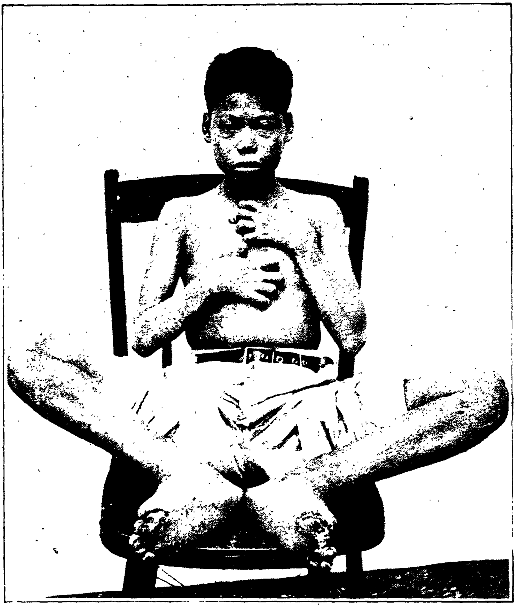
A WELL DEFINED CASE OF TUBERCULAR OR NODULAR LEPROSY



TUBERCULAR LEPROSY, SHOWING EARLY NODULAR LESIONS.



A MIXED CASE OF LEPROSY. Note clubbed end of right thumb and ulcers on fingers. Face presents lesions of the tubercular type.



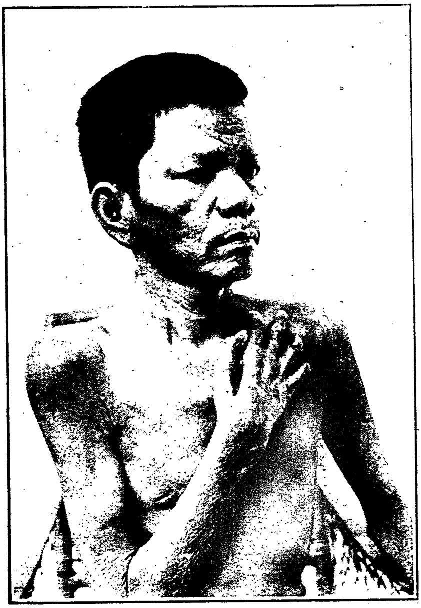
TYPICAL ANAESTHETIC LEPROSY.
Note contraction of fingers, and ulcers on feet.

Chaulmoogra oil	cubic centimeters	60
Camphorated oil	cubic centimeters	60
Resorcin	grams	4

Mix and dissolve with the aid of heat on a water bath, and then filter.

"The foregoing mixture was given as follows: During November, 2 cc. every three days; during December, 5 cc. every eight days; during January, 10 cc. every eight days.

"As this large dose was being borne badly it was reduced to 5 cc., which amount was injected every eight days from February to May. There was apparently no change in his condition at the end of the year following the vaccine treatment. During the treatment with crude chaulmoogra oil by mouth there was some improvement in his condition. This improvement continued during the time that hypodermic injections were given, and on May 6, 1911, all the lesions above described had disappeared and it was impossible to demonstrate the leprosy bacillus. All treatment was then discontinued for a period of one year, during which time he remained negative microscopically. From August 1912, to June 1913,



A CASE OF LEPROSY SHOWING AREAS OF PARCHMENT SKIN ON ARM AND CHEST.

2 cc. were given every ten or thirteen days until the time of discharge.

"The second case was that of C. A., a Filipino woman, age 22, admitted to the San Lazaro Leper Hospital on January 7, 1910. She had a generally suffused countenance and small red macules on the cheeks, forehead and chin. Scrapings from these lesions were positive for leprosy bacilli. Vaccine treatment was begun January 15 and continued for a period of five months. At the end of the first month there was apparently no improvement in her condition, and crude chaulmoogra oil was given by mouth in ascending doses. The initial dose was 30 drops per day and had reached 300 drops at the end of four months. At the close of this period there was some apparent improvement, but the oil was no longer borne well, and the chaulmoogra-oil mixture mentioned in the previous case was administered. For the first month 1 cc. was injected into the buttocks every eight days. The next month 10 cc. was injected every four days. Then one dose of 15 cc. was given. After that 5 cc. was injected every six days. By May 6, 1911, there was great improvement in her general appearance and she was microscopically negative for leprosy. During September 1911, all treatment was discontinued for nine months. Beginning in June 1912, 2 cc. was injected every eight days. Microscopical examinations were made at frequent intervals, but always with negative results. On June 11, 1913, the date of her discharge, all macules had disappeared, but there was still some suffusion of the countenance.

"It is not known whether the vaccine treatment had any influence in these cures. It may be said, however, that there are a number of other cases at San Lázaro Leper Hospital, and at the Culion Leper Colony that have been negative for nearly two years, which presented more marked lesions than those already discharged, and yet they received only chaulmoogra oil, no vaccine being employed.

"Apparent cures have been reported from time to time in the past from San Lazaro Hospital, but unfortunately all of them relapsed or died from some intercurrent disease soon after a period of one year. The cases now reported have been negative for a period of two years and there seems to be ground for hope that the results may be more permanent."

A distinct advance toward the ultimate discovery of a serum for leprosy was made during 1909 by Mr. Moses T. Clegg, at that time employed in the Government laboratories, in the cultivation of the leper bacillus on an artificial media.

There is an urgent need for the services of a commission for the study of leprosy in the Philippines. The field is large and the facilities for research work at Culion are probably unexcelled. It is believed that such a body would, within a comparatively short time, be able to impart definite knowledge as to the method of transmission, which would be of great practical value, and possibly evolve a definite cure for this most distressing malady which makes its victims outcasts from society and condemns them to a life of isolation with scant hope of ultimate recovery.